

Test of Creative Imagination: Validity and Reliability Study*

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Abstract

The purpose of this study was to investigate validity and reliability of the test of creative imagination. This study was conducted with the participation of 1000 children, aged between 9-14 and were studying in six primary schools in the city center of Denizli Province, chosen by cluster ratio sampling. In the study, it was revealed that the Pearson correlation coefficient between judges varied between 0.24-0.55. Kendall's coefficient of concordance was calculated as 0.44; the reliability coefficient, calculated by variance analysis is 0.76. As the result of applying the known-groups technique on the validity studies of the test measurements, while a significant difference was found between the first group comprised by the age group of 7-8-9 and second group comprised by the age group of 10-11 in Fluency sub-scale, no significant difference was found among the groups in Originality sub-scale. In Elaboration and Transformativeness sub-scale of the test, it was found that the number of the shapes used gradually increased with the increasing age. In this study, the validity and the reliability of the creative imagination test measurements were determined to be sufficient.

Key Words

Validity, Reliability, Creative Imagination, Creativity, Imagination.

Although the phenomenon of imagination has long been acknowledged, its importance has not been sufficiently grasped until recently (Johnson, 1987). All types of relationships in the life are partly based on the utilization of the imagination. That is to say

in order to understand the intangible relationships; it is required to create the picture, the image of something beyond the perception of normal physical senses. For example; the imagination is essential for creating the concept of the relationship with a tree in the outside. The imagination provides the chance to see the oxygen, generated by that tree and utilize the oxygen to breathe (Mountain, 2007). By the concept of imagination; humans can be understood, the bits of relations can be caught and the connections between the humans and other objects can be seen (Hodgson & Richards, 1966).

Many people use the imagination in the meaning of creativity. Barrow (1988) points out that the people use the word imaginative as synonymous for being tend to dream and fantasy, introspective, good story teller, sensitive and even for word creative. The imagination is the driving force behind the creativity and utilizing the imagination enable children to establish unusual connections (Beetlestone, 1998). Rowe (2004) indicates that the imagination is an important part of the creative intelligence as a pow-

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eful tool that helps to understand the alternatives and to make visualizations. Craft (2002) says that the imagination and creativity are both related with intention, departure from the rules and disposition and include possibility thinking adding that the imagination may be the pre-condition of creativity. Mellou (1995) states that the imagination and creativity are related and their basic relationship is they are both based on reality for providing alternatives and possibilities for innovations and original changes. Csikszentmihalyi (1997) emphasizes that the creative individuals use imagination and fantasy in one hand and sense of reality in the other hand alternately for separating from the present time without losing the connection with the past.

The creativity always contains the imagination. For separating from the present time, establishing new and unfamiliar connections, playing with the ideas, interiorizing the perceptions and discovering the different possibilities, the ability of imagining is utilized (Duffy, 2006). According to Froebel (1970), the thought gets concretize when we are being creative, the invisible is rendered visible, and the inner is represented outside. The thin line between an academically skilled child and creatively skilled child is comprised of “imagination”, “emotional intensity” and “curiosity” (Sak, 2004). The imagination is a necessary part of the creativeness progress of people (Williams & Walker, 2003). An individual becomes creative as much as the width of his / her imagination. The creative imagination is the power of problem solve and synthesis of human mind by recombining the past life experiences in the creation new images and image patterns (Wilner, 1975).

In some researches; while it has been revealed that the imaginary friends also appear with the children in school age, (Taylor, Carlson, Maring, Gerow, & Charley, 2004) a relationship between the imaginary friends and imaginary verbal lives has also been found (Fernyhough, Bland, Meins, & Coltheart, 2007; Pearson et al., 2001). Also in some studies, it has been indicated that the imaginary worlds from childhood effect the adult imagination in later years and (Root-Bernstein & Root-Bernstein, 2006), the creative imagination can be further enhanced by role playing education (Karwowski & Soszynski, 2008). The imagination is a very powerful yet mysterious ability. Presenting such a mysterious ability is important for new discoveries to emerge. Although the creative imagination is a significant characteristic, no instrument has ever been revealed in Turkey which measures

the creative imagination. In this research, validity and reliability study of the measurements of the creative imagination test, developed by Kujawski have been studied.

Method

Sample

The sampling group, targeted in order to implement the creative imagination test, is comprised of 1000 children among ages of 9-14, who study in six primary schools which agreed to be a part of the study out of the primary schools located in the city center of Denizli, picked by cluster ratio sampling. Cluster ratio sampling is an adjustment made when each cluster does not have the same amount of the sampling element (Neuman, 2008).

Introducing the Test of Creative Imagination

Test of Creative Imagination is a tool, developed by Janusz Kujawski in mid 1990s. The original language of the test is Polish. This test is a paper-pen test that can be applied to the age of 6 and above, can also be applied as a group. The participants are requested to make schematic drawings that do not exist. The duration of the test is 30 minutes.

Test of Creative Imagination is comprised of 3 sub-scales: Fluency, Originality, Elaboration and Transformativeness. Fluency is the number of drawings according to the requirements of the test. The points are given according to the amount of drawings, made within the given time limit; 30 minutes. Elaboration and Transformativeness is the visualization of the drawing. The scoring of Elaboration and Transformativeness sub-scale vary between 2-20 points. In Originality sub-scale, the originality of the ideas that are drawn is evaluated (Karwowski, 2008a).

Original Reliability Study of the Creative Imagination Test

In the original reliability study of the creative imagination test, the Pearson correlation coefficient was calculated over 263 people. Some really significant statistically negative relations were revealed between Fluency and Elaboration as well as Transformativeness sub-scales. ($r=-0.43$, $p=0.0001$). Weak but statistically significant relations were found between Fluency and Originality sub-scales. ($r=0.12$, $p=0.04$). No statistically significant relations were found between Originality and Elaboration as well

as Transformativeness sub-scales. ($r=0.09$, $p=0.17$). In original reliability study, when the Pearson correlation coefficient between judges is examined, the averaging Pearson correlation coefficient varies between 0.41 and 0.50. In the study, it was also indicated that even though Pearson correlation coefficient is not that high, it was still found to be statistically significant. In the original reliability study of the creative imagination test, Kendall's coefficient of concordance was calculated and revealed to vary between 0.29 and 0.47. In addition to the Pearson correlation coefficient and Kendall's coefficient of concordance, Cronbach Alpha coefficient was also calculated and found to vary between 0.55 and 0.75. It is suggested that all the indicated suggest that Originality sub-scale of the creative imagination test shows a strong reliability in medium level (Karwowski, 2008a).

Original Validity Study of the Creative Imagination Test

In the original validity study of the creative imagination test, eight studies were carried out by using similar scale validation. By the Pictorial Test of Creative Thinking a low level relation which is statistically important was found; by the KANH Creative Behavior Questionnaire, a statistically significant and a well harmony was found; by the Scale of Mind Types, a fine relation; by AIM Agora intuition scale a statistically significant and positively low relation with Originality sub-scale of creative imagination test was found; a well defined harmony between openness on experience-consciousness, introversion and Fluency sub-scale of the creative imagination test; a good harmony with the Self Portrait of Stein; good harmony with the Rokeach Value Survey; and a statistically significant negative relation between the Matrix Test that measures the academic intelligence and Elaboration (Transformativeness) sub-scale of creative imagination test were found (Karwowski, 2008b).

Procedure

In order to compile the Turkish version of the Test, linguistic equality, reliability, and validity studies were conducted respectively. The test is comprised of 16 figures and instruction. The fact that the instruction are understood completely by the participants is very important in scope of the reliability of the study. For this reason, after the test was provided, the translation of the test instruction to Turkish had been made by five linguistic experts. After the

completion of the translation, made by five different individuals, the test instruction was translated to English. When the comparison of the original test instruction with the translated test instruction was approved, the test instruction was handed to a Turkish linguistic expert in order to evaluate whether the test was in compliance with the Turkish grammar structure and with the characteristics of the group that the test would be applied, and his suggestions were acquired. The necessary arrangements and modifications which were made by the experts and carried out on the translated test instructions.

Results

Between the subscales of fluency and elaboration as well as transformativeness, a significant relationship in negative direction has been found ($r = -0.39$, $p < .05$). No significant relationship between the subscales of fluency and originality has been revealed ($r = -0.04$, $p > .05$). In addition to those; no significant relationship between the subscales of originality and elaboration as well as transformativeness has been found either ($r = 0.00$, $p > .05$).

Originality sub-scale of the creative imagination test was scored by five judges independently. The judges are expert individuals on child development and psychology. The ninety drawings, made by the children (15 drawings from each of the age groups that take part in the study) were given to the judges as they were requested to submit scores for the drawings. The correlations of the points that were given by five judges to the drawings vary between 0.24 and 0.55. But when the Pearson correlation coefficient is used to calculate the reliability coefficient, it indicates the linear relation between two judges. When Pearson correlation coefficient is used for calculating the reliability between judges, in order to compare means of the scores, acquired from judges, utilization of paired samples t test or ANOVA test for repeated measures is recommended (Goodwin, 2001). The differences of the point averages, given to the 90 drawings by five judges who took part in this study was tested ($F=61.48$) by ANOVA for Repeated Measures and the resulting value is significant at 0.05 level. Upon this result, post-hoc test was used for paired comparison of the point averages of judges and as the conclusion, except one judge, no significant differences between the points averages of the judges were emerged.

In case more than two judges submit their scores, one of the methods, used for determining the re-

liability among judges is Kendall's coefficient of concordance which is a nonparametric statistical method. Kendall's coefficient of concordance (W), shows the level of concordance between judges. The coefficient may take values between 0-1. Kendall's coefficient of concordance reflects no symmetrical opposites between agreement and disagreement when there are more than two judges. There can be all agree between judges but there cannot be all disagree between judges (Siegel, 1956). In this study, the level of consistency of the acquired points regarding the rating of each of the five judges was analyzed by a nonparametric method called Kendall's coefficient of concordance and as the result, the indicated coefficient was found as 0.44 for 90 drawings. In this study, due to the fact that creative imagination test is a figure based test, its reliability coefficient were calculated by variance analysis and the reliability coefficient of the scoring of the five judges for 90 drawings was calculated as 0.76.

In order to present the validity of the creative imagination test measurements in this study, known-groups technique was utilized. In this technique, to estimate the direction of the differences between the groups, measurement tools are applied to the human groups with known characteristics (Frankfort-Nachmias & Nachmias, 1996). In this study, the children were divided into three groups as first group (ages of 7-8-9) second group (ages of 10-11) and third group (ages of 12-13-14) and it was examined difference between groups.

When the findings are examined, regarding Fluency sub-scale of the creative imagination test measurements the lowest mean belongs to age of 7 and the highest mean belongs to age of 11. When the findings are examined, regarding Originality sub-scale of the creative imagination test measurements, the lowest mean belongs to age of 10 and the highest mean belongs to age of 7. When the findings are examined, regarding Elaboration and Transformativeness sub-scale of the creative imagination test measurements the lowest mean belongs to age of 7 and the highest mean belongs to age of 14. In this study it is also revealed that the amounts of figures were increased by the increasing age. In this measurement, if the points diversify between the groups as it was guessed, this provides the evidence of the importance of the test and the validity of known-groups (Howitt & Cramer, 2005). In other words, the factors that were desired to be measured can be measured (Karasar, 1995).

Discussion

Correlations between the sub-scales were calculated in order to study whether each of the sub-scale of the creative imagination test is related with each other or not and whether it is consistent with the literature or not and as the result, a negative medium level and significant relationship was found between the sub-scales of Fluency and Elaboration as well as Transformativeness. It is actually not surprising to obtain such result because of the time limitation of the creative imagination test. It is only natural for an individual who wants to make a lot of drawings within the allowed time limit to depict less detail. Harrington (1999) indicates that some creative individuals may require long time periods. While Andrews and Smith (1996) point out that the time limit has a negative influence on creativity, Baer and Oldham (2006) suggest that a medium level time limitation is a necessity for creativity. In addition, no significant relationships were found between the sub-scales of Fluency and Originality, Originality and Elaboration as well as Transformativeness.

The originality sub scale of the test of creative imagination has been assessed independently by 5 judges. When the correlations between the points that the judges assigned to the drawings are examined, significant relationships have been revealed. In addition to that; statistically significant relations in the original reliability study of the test of creative imagination have been found too (Karwowski, 2008a). Such finding is consistent with the results of the research. In this research, in order to determine the level of correspondence between the points, given by the five scorers regarding each drawing; Kendall's coefficient of concordance has been utilized and the mentioned coefficient was found to be 0,44. From Kendall's coefficient of concordance of 0,44; it is safe to say that there is a positive and mid-level correspondence between five judges. In the original reliability study of the test of creative imagination; the Kendall's coefficient of concordance was revealed to be between 0,29 – 0,47 (Karwowski, 2008a). Such finding also verifies the results of the research.

Since the creative imagination test is a figurative test, reliability coefficient were calculated by variance analysis and the indicated co-efficient was revealed to be 0.76. In the original reliability study of the creative imagination test, Cronbach Alpha coefficient was used. But this coefficient is an average correlation estimate between all the items on the scale (Stangor, 2004). The reliability

index however, can be explained as the definition ratio of the observed point variance of the real point variance. The observed scores variance is expressed as the sum of real points and the error points variances. Parsing the observed points variances to the real points and error point variances enables the real point variances to be estimated by using variance analysis and therefore calculating the reliability (Baykul, 2000). It is acknowledged that the test will be reliable as the reliability coefficient come closer to 1.0. However, both F values were found to be significant. Despite this fact, it is safe to say that the reliability of the test measurements is sufficient because the above mentioned coefficient is 0.76.

When the findings are examined, regarding Fluency sub-scale of the creative imagination test measurements the lowest mean belongs to age of 7 and the highest mean belongs to age of 11. The children at the age of 7 had difficulties to understand the “non-existent” since they are in the concrete operational stage (Piaget, 2004) and even though this test was applied to a great number of seven year old children, the ratio of the completion of the test is very low. According to Davydov and Elkonin (n.d.), it is thought that the primary imagination and figurative thinking abilities are developed enough in children at the age of 7 – 7,5. And those skills provide the formation of foundations of activity and consciousness, required for children to adapt to the surrounding world (as cited in Guruzhapov, 2006). According to the Vygotsky (2004), the creative activity of the imagination depends on the distinctiveness and richness of the past experience because this provides the material that forms the fantasy products. The material that gets into one’s imagination is as rich as the richness of that person’s experience. The experience of the children is not as rich as the experience of adults. The experience gets richer by the age. This is the reason of why the children at the age group of 7 could not present different ideas.

In the test results of the creative imagination test, it is observed that the producing ideas were at the peak point at the children in the age group of 11 then fell into a decline. Urban (2005), in its norm study, conducted in 2500 German children at the ages between 4-16, suggests that there is no significant changes occur above the age of 11, the normal school group. In a similar fashion, Smith and Carlsson (1985), presented that the creativity is at its peak points at the ages of 10-11, an important

decline on the strong creativity skills is observed at the age of 12, around the ages 14-15 the development of the creativity is slow and after the age of 16, a more significant development is observed. Those findings are consistent with the results regarding the validity study of Fluency sub-scale of the creative imagination test.

When the findings are examined, regarding Originality sub-scale of the creative imagination test measurements, the lowest mean belongs to age of 10 and the highest mean belongs to age of 7. When the age goes, the experience gets diversified. For this reason, the same score wasn’t given to the children from the older age groups that drew the same ideas with the children from the younger age groups when Originality sub-scale was calculated, the points given to the same ideas were decreased by the increasing age. The fact that no differences were observed between the groups in Originality sub-scale and the fact that the highest average belonged to the group of age of 7 can be explained by the above indicated points.

When the findings are examined, regarding Elaboration and Transformativeness sub-scale of the creative imagination test measurements the lowest mean belongs to age of 7 and the highest mean belongs to age of 14. The children at the younger age groups had hard time to understand the limitations on using the figures in creative imagination test. For this reason, they may have used less figure not to make an invalid drawing by overusing figures or it can be suggested that the children at the younger age groups opted to express themselves by using less figures.

The psychometric properties of the creative imagination test have were found to be sufficient for this sampling group. The findings of this study were obtained from children that study in primary schools. Although the creative imagination is a very important property, there is no tool in Turkey that measures this property. With this test, it is desired to gather the attention of the researchers to this direction.

The psychometric properties of the creative imagination test that was utilized in this study have been acquired over a limited number of search groups. Standardization studies of the creative imagination test can be conducted in Turkey on larger groups therefore norm tables can be compiled. Also, the relations of the creative imagination with similar scales can also be examined.

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